

12DQ7

PENTODE

FOR TV VIDEO AMPLIFIER APPLICATIONS

DESCRIPTION AND RATING

The 12DQ7 is a miniature power pentode primarily designed for use as the video output amplifier in television receivers. Features of the tube include high transconductance, low interelectrode capacitances, and high power sensitivity. In addition, it has a controlled heater warm-up characteristic.

GENERAL

ELECTRICAL

	Series	Parallel	
Cathode—Coated Unipotential			
Heater Voltage, AC or DC	12.6±10%	6.3	Volts
Heater Current	0.3	0.6±6%	Amperes
Heater Warm-up Time*	...	11	Seconds
Direct Interelectrode Capacitances†			
Grid-Number 1 to Plate, maximum		0.1	μμf
Input		10.0	μμf
Output		3.8	μμf

MECHANICAL

Mounting Position—Any
Envelope—T-6½, Glass
Base—E9-1, Small Button 9-Pin

MAXIMUM RATINGS

DESIGN-MAXIMUM VALUES

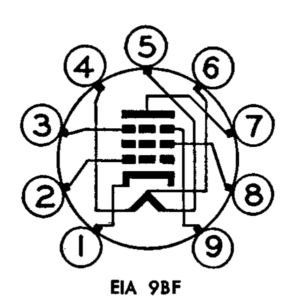
Plate Voltage	330	Volts
Screen-Supply Voltage	330	Volts
Screen Voltage—See Screen Rating Chart		
Positive DC Grid-Number 1 Voltage	0	Volts
Plate Dissipation	6.5	Watts
Screen Dissipation	1.1	Watts
Heater-Cathode Voltage		
Heater Positive with Respect to Cathode		
DC Component	100	Volts
Total DC and Peak	200	Volts
Heater Negative with Respect to Cathode		
Total DC and Peak	200	Volts
Grid-Number 1 Circuit Resistance		
With Fixed Bias	0.25	Megohms
With Cathode Bias	1.0	Megohms

Design-Maximum ratings are limiting values of operating and environmental conditions applicable to a bogey tube of a specified type as defined by its published data, and should not be exceeded under the worst probable conditions.

The tube manufacturer chooses these values to provide acceptable serviceability of the tube, taking responsibility for the effects of changes in operating conditions due to variations in tube characteristics.

The equipment manufacturer should design so that initially and throughout life no design-maximum value for the intended service is exceeded with a bogey tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, and environmental conditions.

BASING DIAGRAM

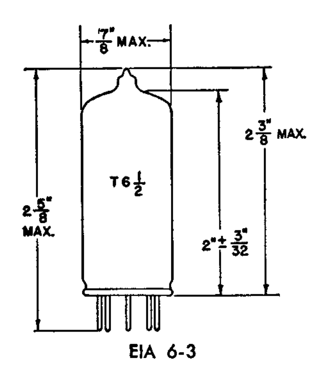


EIA 9BF

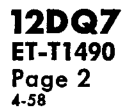
TERMINAL CONNECTIONS

Pin 1—Cathode
Pin 2—Grid Number 1
Pin 3—Internal Shield and Grid Number 3 (Suppressor)
Pin 4—Heater
Pin 5—Heater
Pin 6—Heater Center-Tap
Pin 7—Plate
Pin 8—Grid Number 2 (Screen)
Pin 9—Internal Shield and Grid Number 3 (Suppressor)

PHYSICAL DIMENSIONS



EIA 6-3



CHARACTERISTICS AND TYPICAL OPERATION

CLASS A_1 AMPLIFIER

Plate Voltage	40	200	Volts
Suppressor—Connected to Cathode at Socket			
Screen Voltage	125	125	Volts
Grid-Number 1 Voltage	0‡	...	Volts
Cathode-Bias Resistor	...	68	Ohms
Plate Resistance, approximate	...	53000	Ohms
Transconductance	...	10500	Micromhos
Plate Current	45	26	Milliamperes
Screen Current	16	5.6	Milliamperes
Grid-Number 1 Voltage, approximate			
Ib = 100 Microamperes	...	−9	Volts

* The time required for the voltage across the heater to reach 80 percent of its rated value after applying 4 times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to 3 times the rated heater voltage divided by the rated heater current.

† Without external shield.

‡ Applied for short interval (two seconds maximum) so as not to damage tube.

SCREEN RATING CHART

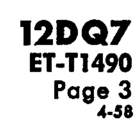
1.4
1.2
1.0
0.8
0.6
0.4
0.2
SCREEN DISSIPATION IN WATTS

AREA OF
PERMISSIBLE OPERATION

0
100
200
300
400
SCREEN VOLTAGE IN VOLTS

K-55611-TD34-1

APRIL 7, 1958



AVERAGE PLATE CHARACTERISTICS

E_f = RATED VALUE
E_{c3} = 0 VOLTS
E_{c2} = 125 VOLTS

I_{c1} @ E_{c1} = +2.0 VOLTS
+2.0
+1.0
+1.0
I_b @ E_{c1} = 0 VOLTS
-1.0
+2.0
-2.0
+1.0
I_{c2} @ E_{c1} = 0 VOLTS
-3.0
-1.0
-4.0
-2.0
-3.0
-5.0
-4.0
-6.0
-6.0
-5.0
-7.0
-7.0

SCREEN CURRENT (I_{c2}) IN MILLIAMPERES: 0, 10, 20, 30, 40, 50
PLATE CURRENT (I_b) IN MILLIAMPERES: 0, 20, 40, 60, 80, 100
GRID-NUMBER 1 CURRENT (I_{c1}) IN MILLIAMPERES: 0, 1, 2, 3, 4, 5
PLATE VOLTAGE IN VOLTS: 0, 100, 200, 300, 400, 500

K-55611-TD36-1

APRIL 22, 1958

AVERAGE PLATE CHARACTERISTICS

E_f = RATED VALUE
E_{c3} = 0 VOLTS
E_{c1} = 0 VOLTS

I_b @ E_{c2} = 150 VOLTS
125
100
I_{c2} @ E_{c2} = 150 VOLTS
75
125
50
100
75
25
50
25

PLATE CURRENT (I_b) IN MILLIAMPERES: 0, 20, 40, 60, 80, 100
SCREEN CURRENT (I_{c2}) IN MILLIAMPERES: 0, 10, 20, 30, 40, 50
PLATE VOLTAGE IN VOLTS: 0, 100, 200, 300, 400, 500

K-55611-TD36-2

APRIL 22, 1958

AVERAGE TRANSFER CHARACTERISTICS

E_f = RATED VALUE
E_b = 200 VOLTS
E_{c3} = 0 VOLTS

E_{c2} = 150 VOLTS, 125, 100, 75, 50, 25

PLATE CURRENT IN MILLIAMPERES: 0, 10, 20, 30, 40, 50

GRID-NUMBER 1 VOLTAGE IN VOLTS: -14, -12, -10, -8, -6, -4, -2, 0

K-55611-TD36-3

APRIL 22, 1958

AVERAGE TRANSFER CHARACTERISTICS

E_f = RATED VALUE
E_b = 200 VOLTS
E_{c3} = 0 VOLTS

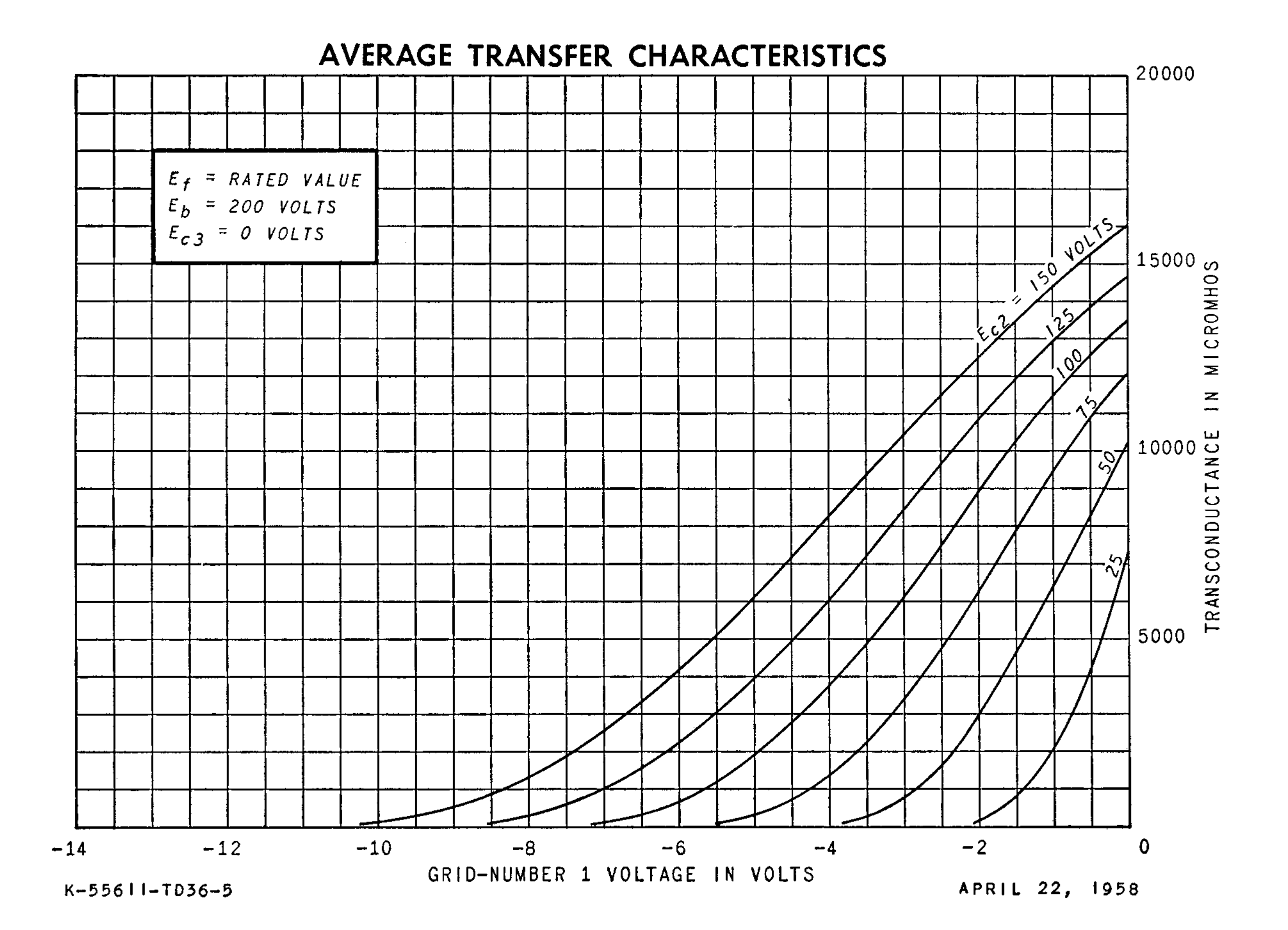
E_{c2} = 150 VOLTS, 125, 100, 75, 50, 25

SCREEN CURRENT (I_{c2}) IN MILLIAMPERES: 0, 2, 4, 6, 8, 10

GRID-NUMBER 1 VOLTAGE IN VOLTS: -14, -12, -10, -8, -6, -4, -2, 0

K-55611-TD36-4

APRIL 22, 1958


AVERAGE TRANSFER CHARACTERISTICS
Ef = RATED VALUE
Eb = 200 VOLTS
Ec3 = 0 VOLTS
Ec2 = 150 VOLTS
125
100
75
50
25
20000
15000
10000
5000
0
TRANSCONDUCTANCE IN MICROMHOS
-14
-12
-10
-8
-6
-4
-2
GRID-NUMBER 1 VOLTAGE IN VOLTS
K-55611-TD36-5
APRIL 22, 1958